

## REMARKS

Upon entry of the Amendment, which is respectfully requested, claims 1-4 are all the claims pending in the application.

Claims 1, 3 and 4 are amended in order to more clearly point out the claimed feature of the invention.

Support for the amendments of claims 1 and 4 can be found in the specification, for example, page 13, lines 5-8, the paragraph bridging pages 18 and 19, and Figure 5. Support for the amendment of claim 3 can be found in the specification, for example, at page 16, second full paragraph.

No new matter has been introduced and entry of the amendment is respectfully requested.

### **Response to Rejections under 35 U.S.C. §103(a)**

In the Office Action, Claims 1 and 2 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Japanese Patent Application Publication JP 8-155233 ("JP '233").

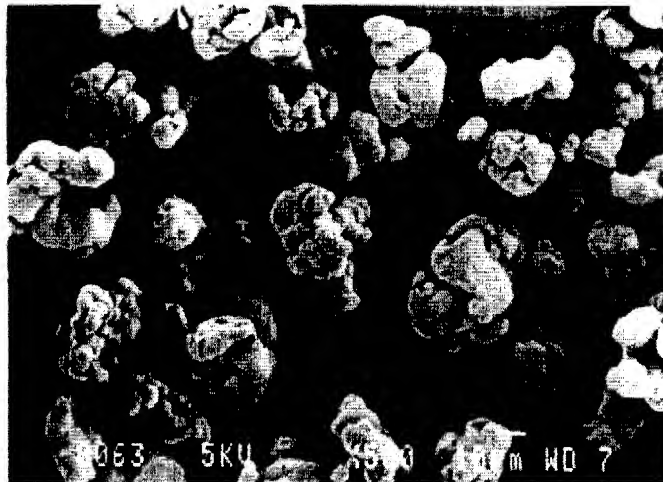
Applicants respectfully traverse.

Comparing the features of claim 1 of the present application with those of JP '233, Applicants respectfully submit that JP '233 does not disclose a specific size for the voids formed between the ultrahigh molecular weight (UHMW) polyethylene aggregates. Furthermore, Applicants respectfully submit that the bulk specific gravity of present claim 1 is from 0.15 to 0.29, whereas in JP '233 the bulk specific gravity ranges from 0.30 to 0.50.

Turning to the size of the voids between the UHMW polyethylene aggregates, the Office states at page of the Office Action that

*"[t]he UHMW has the same property and, therefore, JP '233 clearly discloses the void size."*

Applicants respectfully submit that in fact, UHMW aggregates exist in various forms. For example, they may be nearly spherical or in the shape of a pointed sugar candy ball. In contrast, the aggregates of present claim 1 are in the shape of a bunch of grapes or a cauliflower. See Fig. 5 of the instant application, which is reproduced below.



*Electron Micrograph of the aggregated particles of the present invention having voids (pores) of from about 1 to 5  $\mu$ m and shaped like bunches of grapes or a cauliflower. (Figure 5 of the present specification.)*

Since JP '233 does not specifically disclose that the shape of the aggregates is in the shape of a bunch of grapes or a cauliflower, it would not be obvious to a person of ordinary skill in the art that the disclosures of JP '233 would result in the aggregates as disclosed in present claim 1 with a reasonable expectation of success.

With regard to the bulk specific gravity as disclosed in present claim 1, Applicants respectfully submit that the difference in the shape between the aggregate particles of present claim 1 and JP '233 implies that the bulk specific gravity of the two materials will also differ. The unique shape of the aggregates, as in the present invention, has a smaller bulk specific

gravity range of 0.15 to 0.29, as compared to that of JP '233, *i.e.*, 0.30 to 0.50. Applicants therefore, respectfully request reconsideration and withdrawal of the rejection of claims 1 and 2 in view of JP '233.

In the Office Action, Claims 1 and 2 are further rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Herding et al. (U.S. Patent No. US 5,547,481).

Applicants respectfully traverse.

Claim 1 of the present application recites the bulk specific density of the UHMW polyethylene in a range from 0.15 to 0.29.

In Herding, at column 5, lines 3-5, it is stated that

*“The grains of ultrahigh-molecular polyethylene preferably have a bulk density of 300 to 550 g/l, whereby 350 to 500 g/l is particularly preferred.”*

Therefore, the Herding invention would preferably have a specific gravity of between 0.35 and 0.5 g/ml. At page 3 of the Office Action, the Office states that though Herding does not teach the bulk specific gravity of the polyethylene of the present invention, one of ordinary skill would have recognized that the specific gravity of 0.3 g/l of Herding could be easily adjusted to 0.29 g/ml of the present invention with an expectation of success.

With regard to Herding, Applicants respectfully submit that the bulk density of 300 g/l (specific gravity = 0.30) is the specific gravity of ultrahigh molecular weight polyethylene which is used as a filter element base, not a coating material. The coating material used in Herding is polytetrafluoroethylene (PTFE), which is different from the UHMW polyethylene of the present invention. In fact, Comparative Example 1 of the present invention clearly demonstrates that the

coating used in the present invention (polyethylene) has improved air permeability over a PTFE coating. The claimed filter element shows a low pressure loss and an improved collecting property, which are attributed by the voids formed in the ultrahigh molecular weight polyethylene powder aggregates that have a unique shape.

Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 1 and 2 in view of Herding.

In the Office Action, Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over JP '233 or Herding in view of Kawaguchi et al. (U.S. Patent No. 6,615,243).

Applicants respectfully submit that claim 3 is in condition for allowance, at least by virtue of its dependence from claim 1, since Kawaguchi does not cure the deficiencies of JP '233 or Herding, as discussed above with respect to claim 1.

Furthermore, Kawaguchi is an application for an antifungal and antibacterial air filter in which a thermoplastic resin such as polypropylene and polyethylene is made into yarn and then made into woven/knitted cloth. With regard to an antioxidant, in the bridging paragraph of columns 4 and 5 Kawaguchi states that

*“... usually used additives such as an antioxidant... may be mixed with the thermoplastic resin of the present invention.”*

Kawaguchi does not suggest a unique method of addition of an antioxidant according to the present invention.

The method of addition of an antioxidant according to the present invention has a characteristic feature. It is a method where

*“...the mixture is heated to a temperature which is higher than the melting point where the antioxidant liquefies and is in the range where the synthetic resin powders substantially retain their shape, preferably to a temperature higher than the melting point of the antioxidant and lower than the melting point of the synthetic resin powder. The mixture is retained at a temperature for 15 to 120 minutes, and more preferably for 30 to 120 minutes, thus the antioxidant is infiltrated into the synthetic resin powder.”*

Specification, page 17, lines 1-12.

In other words, it is a heating and impregnating method and is not a mere kneading method as known in the art. Therefore, this method is a method which is specific to the present invention. In a kneading method in the publicly known art, the resulting resin composition after addition of an antioxidant becomes a non-porous solid but, according to the heating and impregnating method of the present invention, it is now possible that an antioxidant is added while the shape of the resin particles is still maintained and, when the resin particles after addition of an antioxidant are directly sintered or coated, an air-permeable porous product is able to be prepared. That is a method which is not taught nor suggested by Kawaguchi.

Applicants therefore respectfully submit that simply adding an antioxidant to a resin, as disclosed in Kawaguchi, would not have resulted in the specific features of the present invention. Applicants therefore request the reconsideration and withdrawal of the rejection of claim 3 under §103(a).

In the Office Action, Claim 4 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over JP ‘233.

Applicants respectfully submit that claim 4 is a method claim for the filter element of claim 1. Since claim 1 and claim 4 include the same elements, Applicants’ arguments directed

towards the rejection of claims 1 and 2 based on JP '233 as discussed above are applicable to the rejection of claim 4.

Applicants therefore respectfully request reconsideration and withdrawal of the §103 rejection of claim 4.

**Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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